



Combined Project Information Documents / Integrated Safeguards Datasheet (PID/ISDS)

Appraisal Stage | Date Prepared/Updated: 07-Aug-2018 | Report No: PIDISDSA24605



BASIC INFORMATION

A. Basic Project Data

| | | | |
|--|--|---|---|
| Country India | Project ID P166977 | Project Name Dam Rehabilitation & Improvement Project - Additional Financing | Parent Project ID (if any) P089985 |
| Parent Project Name IN Dam Rehabilitation and Improvement Project | Region SOUTH ASIA | Estimated Appraisal Date 09-Aug-2018 | Estimated Board Date 18-Sep-2018 |
| Practice Area (Lead) Water | Financing Instrument Investment Project Financing | Borrower(s) Department of Economic Affairs, Madhya Pradesh Water Resources Department, Central Water Commission under Ministry of Water Resources, River Development and Ganga Rejuvenation, Damodar Valley Corporation (DVC), Karnataka Water Resources Development Organisation, Kerala State Electricity Board, Kerala Water Resources Department, Odisha Water Resource Department, Tamil Nadu Water Resources Department, TANGEDCO Tamil Nadu, Uttarakhand Jal Vidyut Nigam Limited | Implementing Agency Central Water Commission under the Ministry of Water Resources, Damodar Valley Corporation (DVC), Uttarakhand Jal Vidyut Nigam Limited |

Proposed Development Objective(s) Parent

To improve the safety and operational performance of selected existing dams in the territory of the of the participating states. The PDO will be achieved through rehabilitation and improvement of dams and improvement in central and state-level institutional capacity to sustainably manage dam safety administration and operation and maintenance.



Components

Rehabilitation and Improvement of Dams and Associated Appurtenances
Dam Safety Institutional Strengthening
Project Management

PROJECT FINANCING DATA (US\$, Millions)

SUMMARY

| | |
|---------------------------|--------|
| Total Project Cost | 196.00 |
| Total Financing | 196.00 |
| of which IBRD/IDA | 137.00 |
| Financing Gap | 0.00 |

DETAILS

World Bank Group Financing

| | |
|--|--------|
| International Bank for Reconstruction and Development (IBRD) | 137.00 |
|--|--------|

Non-World Bank Group Financing

| | |
|---------------------|-------|
| Counterpart Funding | 59.00 |
| Borrowing Agency | 59.00 |

Environmental Assessment Category

A-Full Assessment

Decision

The review did authorize the team to appraise and negotiate

Other Decision (as needed)

B. Introduction and Context

Country and Sectoral Context

1. Water resources development is a key focus area for the Government of India (GoI) and state governments in the country, given increasing water scarcity and the rising competing demands. India is home to some of the world's most sizeable river diversion infrastructure, and ranks



third after China and the United States in terms of the number of dams. These dams have played a key role in fostering sustained growth in the agricultural and rural economy, which are development priorities for the GoI. Irrigated agriculture has been a major pillar of the government's strategy to improve livelihoods and to ensure food security.

2. In India, rainfall occurs mainly in intense and unpredictable downpours during the short monsoon seasons. As a result of this high temporal and spatial variability, rainfall cannot meet the needs of year-round irrigation and other water demands. Climate change induced impacts on meteorological parameters are likely to compound the issue of water availability. Over the course of the last 50 years, India has invested heavily in infrastructure to store surface runoff in reservoirs formed by large, medium, and small dams with associated appurtenances. At the end of 2016, accordingly to National Register for Large Dams (NRLD), there were about 4,857 completed large dams¹ in India, with another 341 under construction. The total storage capacity of these dams is about 304 billion cubic meters. The reservoirs formed by the large dams are either single or multi-purpose, and serve functions pertaining to water supply, power generation, flood control, irrigation, and/or recreation. Most of these dams were constructed and are maintained by state governments, through their irrigation and water resources departments. A few public entities such as the Damodar Valley Corporation (DVC), Uttarakhand Jal Vidyut Nigam Limited (UJVNL), Mumbai Municipal Corporation, and various State Electricity Boards also own and operate dams. Besides large dams, there are tens of thousands of medium and small dams in the country that have been constructed and are maintained by various agencies.
3. As a result of population growth and development in downstream areas of dams, the potential damage as a result of catastrophic flooding has increased significantly. Existing flood protection measures are often below acceptable standards, causing serious risks. An ever-increasing number of people are living and working in areas that would face sudden and severe flooding in the event of a dam failure. In rural areas, the property at risk is affected by increasing values of buildings, irrigation and drainage facilities, and other infrastructure. Similarly, in urban areas, the value of property, buildings, and infrastructure at risk has also significantly increased and will continue to increase due to urban agglomeration, economic growth, industrialization and climate change.
4. Additionally, there has been minimal investment in extensive O&M of structures since dam construction and commissioning. Many existing dams are ageing (605 dams are over 50 years old and another 3095 dams are over 25 years old) and have various structural deficiencies as well as shortcomings in operation and monitoring facilities. In most states, budgets for dam O&M are part of the larger budget for irrigation system maintenance. This budget is typically decided on the basis of the total irrigated area rather than on preventative and scheduled

¹ The International Commission on Large Dams (ICOLD) defines a large dam as one more than 15 m high, or more than 10 m high and either more than 500 m long or with a reservoir volume more than one million m³ or with a maximum flood discharge greater than 2,000 m³ or with difficult or unusual features.



maintenance needs. In practice, irrigation canal maintenance tends to be prioritized over dam maintenance, which has led to deterioration of various dam structures. Allocations for O&M should be more in line with need-based assessments and India is beginning to adopt modern asset management planning to guide this process. Most large dams are considered ‘high-hazard’².

5. High safety standards for large dams are imperative to prevent failure that would cause devastating damage to environment and property, which could then lead to economic hardship, and, in extreme cases, loss of life. Structural integrity and safety are necessary to reduce risks and help assure sustainability and full operational capacity of existing storage through early identification and resolution of problems. Action is required to: (i) ensure rehabilitation and modernization of dams to bring them back to acceptable standards of safety and operation; (ii) develop and implement adequate O&M programs; (iii) ensure regular review of safety at dams, both by operator and independent review panels; and (iv) formulate standards, guidelines and asset management systems to minimize future risks of dam failures.
6. GoI is cognizant of the need for large-scale renovation of the country’s dams, and since 2010 has been implementing the World Bank-supported Dam Rehabilitation and Improvement Project (DRIP) to begin to address dam safety concerns. With support from DRIP, the Central Water Commission (CWC), which has oversight on the national level for dams, has recently adopted the Dam Health and Rehabilitation Monitoring Application (DHARMA) tool and introduced seven new dam safety guidelines aimed at helping the country focus on dam rehabilitation using a variety of best practices.
7. In addition, CWC has prepared a comprehensive National Dam Safety Act (first drafted in 2002, updated in 2008 and 2016), which has been recently approved by the Cabinet. The same will be presented in the coming Parliament session for approval. All states with Dam Safety Organizations (DSOs) are already in general compliance with the provisions outlined in the draft Dam Safety Act, including regular inspections of all large dams and functional independent Dam Safety Review Panels (DSRP). All DRIP implementing states have established DSOs except for the state of Karnataka, where the DSO is being established as part of DRIP implementation.
8. Given the large number of dams in India, DRIP has acted as a lighthouse, showcasing the process of returning dams to a fully operational state and to ensure safer conditions in a technically sound and financially sustainable manner. In addition to this it has been building much needed capacity for monitoring the performance of dams.
9. The current climate risk profile for DRIP sub-projects/ activities has identified the following

² High-hazard is a term used by a majority of dam safety programs. While the definition varies slightly from place to place, in India it generally refers to a substantial potential loss of life and high property damage if failure of a high-hazard dam occurs.



climate change-related risks: overtopping of the dam; downstream inundation; and gate as well as structural failure of the dam due to sudden inflow of high quantum of water due to cloud burst (in the Himalayan region) or tropical cyclonic rainfall (peninsular India). The activities proposed to be carried out under AF are designed to reduce these climate change induced risks and rehabilitate the selected dams to fully safe and operation conditions.

10. The MoWR, RD&GR through the Department of Economic Affairs, Government of India, has requested an IBRD loan for Additional Financing (AF) of US\$137 million out of the total Additional Financing (AF) requirement of US\$ 196 million to cover: (a) financing gap and (b) cost over-runs for the ongoing DRIP. Based on the results of studies carried out early in project implementation, the construction and contracting plans and detailed dam-wise cost estimates were prepared by the IAs. These plans included several activities that were not envisaged in the original project design. This resulted in slow progress in the initial three years of the project, in addition to increased costs and time overruns. The pace of project implementation and rehabilitation activities in all DRIP dams has increased incrementally from the fourth year, due in large part to the greater capacity of IAs and their ability to overcome initial hindrances in contracting. However, a few critical activities still need to be undertaken to ensure satisfactory achievement of the Project Development Objectives (PDO). Thus, AF is required to undertake additional activities as well as to complete ongoing activities required to meet the project objectives.

C. Proposed Development Objective(s)

11. The original PDO is to improve the safety and operational performance of selected existing dams in the territory of the of the participating states.
12. Proposed PDO for Additional Financing: No change from the original PDO.

Key Results

13. The PDO will be achieved through rehabilitation and improvement of dams and improvement in central and state-level institutional capacity to sustainably manage dam safety administration and operation and maintenance. Key performance indicators to measure the achievement of the PDO include:
 - Number of project dams with: (i) the ability to safely cater for design floods; and (ii) acceptable stability and seepage. Dams are thus returned to full operational conditions, with reduced risk of failure;
 - Number of project dams with need-based O&M plans operationalized. Specific measurements to measure this indicator include availability of detailed operation and maintenance manuals, regular inspections, and development of information technology and analytical tools to generate, collect, evaluate, monitor, and disseminate data on dam safety and operations;
 - Number of project dams with basic dam safety facilities in place;
 - Percentage of required budget per state for adequate O&M of dams; and



- Number of project dams where emergency response plans have been prepared and disseminated to the population.

D. Project Description

14. The original DRIP had three components:

a. *Rehabilitation and Improvement of Dams and Associated Appurtenances*, DRIP is financing the rehabilitation of 223 project dams, many of which are more than 25 years old and for which the current risk profile with respect to climate change induced impacts is also a matter of significant concern. The ongoing interventions include: treatment of leakage through masonry and concrete dams and reduction of seepage through earth dams; improving dam drainage rehabilitation and improvement of spillways, head regulators, draw-off gates and their operating mechanisms, stilling basins, and downstream spillway channels; improving approach roads; improving office and housing accommodation; and improving dam safety instrumentation. The project also supports hydrological assessments (including inflow assessment to understand the changes in the hydrological inflow regimes as well the futuristic flow in the light of climate change) and specialized consulting services to formulate strategy for long-term management of these changing hydrological regimes. In addition, preparation and implementation of asset management plans, dam-wise Emergency Action Plans (including long term action plans to mitigate climate change induced risks), emergency warning systems, public awareness campaigns and flood inundation mapping are ongoing in all participating states.

b. *Dam Safety Institutional Strengthening*, focusing on regulatory and technical frameworks for dam safety assurance. The activities include customized training nationally and internationally to the Central Dam Safety Organizations (CDSO) and the State Dam Safety Organizations (SDSO); participate in dam safety courses; study tours, and linking with foreign agencies that have advanced dam safety programs such as the United States and Australia; development of Management Information Systems (MIS) and other programs to capture and analyze data for long-term planning including futuristic climate change scenarios and guiding of dam operations including the DHARMA tool; and training in hazard and vulnerability assessment and dam-break analysis.

c. *Project Management*: Establishment and operation of project monitoring and management units at central (Central Project Management Unit – CPMU) and state (State Project Management Units – SPMUs) levels.

15. The proposed AF will support activities within the original scope of DRIP and cover (A) a financing gap and (B) cost over-runs of the original DRIP as described below:

- A. **Financing Gap (USD 83 million):** There is a financing gap of USD 83 million. A significant amount relates to the Hirakud Dam, Odisha, while the remaining amount covers project management related costs which will be incurred as a result of time extension of the project.



- i. **Hirakud Dam (USD 62 million):** The fourth largest dam in India in terms of capacity and the longest dam in the world, Hirakud Dam was included in DRIP from the beginning of the project for rehabilitation works. During project preparation, based on the existing hydrology report and limited available information, the Odisha Government in consultation with CWC prepared a tentative rehabilitation plan costing USD 2.5 million. Subsequently, under DRIP, a detailed investigation including revised hydrological assessment, underwater investigation, etc. was carried out to gain a thorough understanding of the prevailing condition of the dam and to develop a comprehensive rehabilitation plan to enhance its safety. The hydrological review carried out in the light of the changing climate of the Hirakud Dam provided a revised design flood, estimated at 69,623 m³/s as compared to the original project design flood of 42,450 m³/s (an increase of 27,182 m³/s). The flood routing analysis indicated that of the additional 27,182 m³/s, 6,000 m³/s can be passed through the existing dam spillway itself and for the remaining 21,000 m³/s, additional spillways need to be constructed. Site investigations concluded that it would not be possible to safely pass the additional 21,000 m³/s discharge by construction of one spillway; instead, two spillways, one on the left bank and one on the right bank, with flood discharge capacities of 9,000 m³/s and 12,000 m³/s respectively, would need to be constructed. Considering the nature and extent of land acquisition required for constructing the two spillways, it was determined that only the left bank spillway could be completed in three years. The construction of the right bank spillway would require 5-6 years. Based on the findings of this detailed assessment, the Odisha Government proposed the inclusion of the left bank spillway under the DRIP-AF. (For the right bank additional spillway, as land acquisition and construction will take longer, the Odisha Government has committed to secure complementary funds for the construction either under state funds or from external sources). Accordingly, the bid document for the left bank spillway has been prepared and is in an advanced stage of tendering. The estimated costs for the construction of the left bank spillway are given below:
 - (a) Construction of left bank spillway – USD 58 million
 - (b) Consultancy for Construction Supervisor – USD 4 million
 - ii. **Additional costs for project management and consultancies and institutional strengthening (USD 21 million):** Due to extension of the project period by 3 years (2 years for the ongoing project and one year additional for the AF), there is a financing gap for covering the cost of the Project Management Consultancies, and the cost of managing and supervising the project by the 10 project implementing agencies as well their institutional capacity building including understanding climate change induced risk in dam safety and management and developing strategies to mitigate these risks.
- B. Cost over-runs (USD 54 million):** Cost over-runs are due to two factors: (i) the difference between the original estimated costs at the time of project preparation and the actual total



cumulative costs of the contracts as awarded (USD 35 million); and (ii) the cost difference due to variation of quantities during the construction period as well as inclusion of additional items identified during the construction period, after contract award (USD 19 million).

16. The table below summarizes the state-wise allocation of fund under the AF.

| Sl. No. | IA | Original Allocation (M US\$) | AF Allocation (M US\$) |
|---------|-----------|------------------------------|------------------------|
| 1 | Kerala | 46.67 | 20.43 |
| 2 | Odisha | 24.67 | 60.25 |
| 3 | MP | 52.33 | 0.00 |
| 4 | TN | 124.33 | 5.53 |
| 5 | Karnataka | 46.17 | 29.74 |
| 6 | UJVNL | 10.67 | 10.43 |
| 7 | DVC | 23.17 | 0.00 |
| 8 | CWC | 22.00 | 10.62 |
| | TOTAL | 350.00 | 137.00 |

E. Implementation

Institutional and Implementation Arrangements

17. Implementation Arrangements: The organizational structure for day-to-day project coordination and management of DRIP consists of a Project Management Unit (PMU) at the central level in CWC and one State level PMU for each of the nine implementing agencies. All PMUs are staffed with qualified government staff, supplemented with consultants so that the needed technical, safeguard, monitoring and evaluation (M&E) and fiduciary (procurement and financial management) capacity is available. A multi-disciplinary management and engineering consulting firm assists CWC with the overall implementation of the project.

18. A National Level Steering Committee (NLSC) has been established for oversight on dam safety assurance and rehabilitation, and disaster management. The NLSC is headed by the Secretary MOWR, and includes senior representatives from CWC and participating states. A separate Technical Committee (TC) is also in place providing technical input to NLSC, coordinate with implementing committees of respective state governments, and review



progress of development projects.

19. Third-party construction supervision and quality control arrangements is in place through CWC, with extensive assistance of the management and engineering consulting firm. This consulting firm also provides management and technical advice to CWC, WRDs, SEBs, and SDSOs including procurement, safeguards, and financial management. The firm also conducts periodic reviews of the internal control systems, and assists with the monitoring of the physical and financial progress and the governance and accountability action plan (GAAP).

Implementation Status

20. DRIP was approved by the Board on June 29, 2010, and was declared effective on April 18, 2012. During the initial three years of implementation, the focus was on screening dams and preparing safety plans and the physical investments. Thereafter, physical implementation accelerated, and over the past three years there has been significant progress in awarding capital works contracts, initiating the remaining procurement packages, and disbursements by all ten Implementing Agencies (IAs). As of June 2018, 702 contracts amounting to US\$ 255 million have been committed through awarded contracts. As of June 2018, the project has disbursed 67% of the total project loan/credit amount. The IDA component of the funding (US\$139.65 million) has been fully disbursed and the IBRD funding (US\$139.65 million) is 34% disbursed (June 2018).
21. Progress has also been made on the institutional strengthening component. An annual training calendar (national as well as international) focusing on various dam safety aspects including instrumentation, dam break analysis, asset management, project management and construction supervisory etc. for the calendar year 2018 was prepared and is being implemented. So far, 87 training programs (four international and 83 national) have been carried out benefiting more than 3,000 central and state government officials. In addition, guidelines have been prepared for: a) dam instrumentation and monitoring; b) dam safety operations after seismic events and five other selected topics relevant to dam safety and management.
22. Based on the significant achievement made in the progress of activities, currently the Project Development Objectives (PDO) and Implementation Progress (IP) are rated as Moderately Satisfactory (MS).
23. The project is fully compliant with its legal covenants.
24. Climate change: Through the proposed AF, the Bank is also well placed to link project activities to issues related to climate change and disaster management, which are important in determining O&M needs. Optimization of water storage is important, not only to satisfy a growing population and to support the rapidly developing economy, but also to prepare for possible negative impacts of climate change (both more serious flood and drought events). Similarly, the Bank's experiences with disaster risk management have assisted the state governments with better management of the dams and flood waters.



F. Project location and Salient physical characteristics relevant to the safeguard analysis (if known)

The project is implemented in the states of Kerala, Karnataka, Madhya Pradesh, Odisha, Uttarakhand, and Tamil Nadu as well as in Damodar Valley. A total of 223 existing large dams are targeted.

G. Environmental and Social Safeguards Specialists on the Team

Suryanarayana Satish, Social Safeguards Specialist
Gopalaswamy Srihari, Social Safeguards Specialist
Pyush Dogra, Environmental Safeguards Specialist

SAFEGUARD POLICIES THAT MIGHT APPLY

| Safeguard Policies | Triggered? | Explanation (Optional) |
|--|------------|---|
| Environmental Assessment OP/BP 4.01 | Yes | No change from Original Project. |
| Performance Standards for Private Sector Activities OP/BP 4.03 | No | No change from Original Project. |
| Natural Habitats OP/BP 4.04 | Yes | While no endangered species are found in the project area, however, there maybe potential substantial loss of ecological functions provided by trees that will be cut during the construction process. the EMP has provision for afforestation and mitigation measures. |
| Forests OP/BP 4.36 | Yes | Since construction of Additional Spillway at Hirakud Dam will involve diversion of 9.441 hectare of forest land. It will involve removal of around 3600 trees and a EMP will include afforestation of double the number of trees. |
| Pest Management OP 4.09 | Yes | It is envisaged that no pesticide will be procured under the project and only chemical treatment which is a practice during forest management in India will be carried out. However, in the interest to ensure no pesticide is use, the policy is triggered. |
| Physical Cultural Resources OP/BP 4.11 | Yes | No change from Original Project. |
| Indigenous Peoples OP/BP 4.10 | Yes | No change from Original Project. |



| | | |
|--|-----|----------------------------------|
| Involuntary Resettlement OP/BP 4.12 | Yes | No change from Original Project. |
| Safety of Dams OP/BP 4.37 | Yes | No change from Original Project. |
| Projects on International Waterways OP/BP 7.50 | Yes | No change from Original Project. |
| Projects in Disputed Areas OP/BP 7.60 | No | No change from Original Project. |

KEY SAFEGUARD POLICY ISSUES AND THEIR MANAGEMENT

A. Summary of Key Safeguard Issues

1. Describe any safeguard issues and impacts associated with the proposed project. Identify and describe any potential large scale, significant and/or irreversible impacts:

Under the parent project no land acquisition/physical or economic resettlement took place. However, the sub-projects proposed under Additional Financing broadly comprises two categories of activities. First category involves creation of new infrastructure such as construction of additional spillway at Hirakud Dam, Odisha and dam related office infrastructure at Kerala. In this category, adverse social impacts such as physical displacement of 716 households have been identified at Hirakud Dam, for which, Resettlement Action Plan (RAP) has already been prepared and approved by RSA. Barring Hirakud, in respect of other dam rehabilitations, impacts are temporary in nature and reversible as these do not involve disruption or loss of access to communities. The second category involves rehabilitation works such as improvements to existing control systems, surveillance systems, repairs to approach or service roads, repairs to existing spillway, repairs/replacement of sluice gates, Turfing etc., across many dams in the participating states. Screening of these projects indicate that there are nil or minor temporary impacts on communities.

The sub-projects proposed under Additional Financing will have environmental impacts similar to the sub-projects financed under the Original Project (which are mainly related to construction period impacts, and are temporary and reversible in nature, such as disturbance to borrow areas, etc.). Except that an additional impact of the Hirakud sub-project will use 1.9 percent (9.41ha) of a degraded forest area (overall area of this degraded forest with mainly scrub and scanty vegetation is 490ha), and cutting down of 3,610 trees of which around 115 trees are within the said degraded forest area. However, there is no possibility of negative impact on the health and quality of the forests as the forest is already highly degraded and project EMP allows afforestation in the degraded area. The compensatory afforestation by the project will, in effect, improve the quality of this patch of forest. No wildlife, migratory birds and fish are expected to be impacted. The closest natural habitat or endemic bird area is more than 13km away with the areas in between populated by several villages. Therefore, additional financing phase of the project has been classified category "A" and an independent EIA has been undertaken for Hirakund Dam for additional spillway investment which has been cleared by the Bank. The EIA was disclosed in country on February. 28, 2018 and updated version is now available on web sites of CWC (<https://damsafety.in/>) and Odisha Government (www.dowrodisha.gov.in).

2. Describe any potential indirect and/or long term impacts due to anticipated future activities in the project area:

The project investments will improve the safety and operation of the project dams including revising design floods as per latest norms and standards. All the interventions ensure that structural or non-structural measures are in place to safely cater for the increased design floods and are expected to reduce the failure risk of dams. One of the key sub-projects under Additional Financing with significant future outlook is the construction of additional spillway at Hirakud



Dam in Odisha, one of the oldest multi- purpose dams in the country. Constructed in 1957, it serves more than 30 million people and several towns, cities and villages. The spillway aims at ensuring the safety of the dams and the surrounding environ which will prevent possibility of huge human and economic losses, especially as there are about 3 million people living downstream of this dam. Possible, but not likely negative induced impacts may involve increase in downstream population as agriculture is further intensified, which may additionally lead to disturbance of the coastal geomorphological processes (and consequent erosion and accretion). While the first set of issues related to population density will need to be managed by long-term land use planning processes, the coast and shoreline will be managed through the shoreline management plans and coastal zone management plans currently being developed by the Government of Odisha.

3. Describe any project alternatives (if relevant) considered to help avoid or minimize adverse impacts.

In case of the Hirakud sub-project under the Additional Financing, alternatives were considered from safety, technical, social and environmental paramters. These included options of either raising the height of existing dam, construction of additional spillways on left and right bank dykes, lowering the spillway crest, etc., following which the most suitable option was chosen. As for other civil works such as construction of new dam related office infrastructure, adverse impacts have been minimized by utilizing available government land or department land. Screening undertaken confirmed that these sites are free from encumbrances, and protected ecological resources.

4. Describe measures taken by the borrower to address safeguard policy issues. Provide an assessment of borrower capacity to plan and implement the measures described.

The ESMF prepared for the original project described the possible environmental and social impacts for each of expected rehabilitation activities. It provided templates to identify environment and social (E&S) impacts of each activity and their components; categorize them into A, B, C based on nature and magnitude of impact (significant, moderate and less significant respectively); and identify mitigation measures for preparation of mitigation plans. The ESMF detailed responsibilities of entities for implementation and monitoring of the proposed mitigation measures.

Based on the screening criteria described in the ESMF, proposed activities under each dam have been categorized depending on sensitivity of the intervention required. A template for each dam summarizes the information collected during investigations as well as during the initial design of the interventions along with environmental and social aspects. The State Project Management Unit (SPMU) carried out screening using each template, before submission to the Central PMU (CPMU) in the Central Water Commission – the main implementing agency. The Bank Task Team received and reviewed each template. Based on review of these templates, a final categorization of each of the dams was made. The categories are C -- no environmental and social issues nor technical issues, and designs can be finalized and tendered immediately; B -- requiring a brief dam-specific EMP and RAP to be prepared by the concerned state implementing agency and approved by the SPMU before the start of the works; and A -- requiring a well-defined EMP and RAP (and TDP) before implementation, prepared by the concerned state implementing agency. The respective State Implementing Agencies would be responsible to prepare these plans with assistance of consultants, as needed and with approval to be provided by the CPMU and the World Bank. The EMP will become part of the civil works contract and has to be adhered to and costed by the contractor. While no tribal communities (indigenous people) have been identified to be affected by project activities, in the event that a specific dam taken up under the project does affect tribal communities (indigenous people), the ESMF describes the processes to be followed in preparation of an Indigenous People Development Plan. The ESMF envisaged environmental and social capacity building at various levels to make sure that all staff involved in the project is aware of the ESMF and how to address environmental and social issues for each dam.

Since, from the ESMF screening perspective, Hirakund dam involves significant impacts on the social safeguard end, a



detailed EA and EMP and Resettlement Action Plan (RAP) has been prepared. The Construction of the spillway and implementation of the RAP at Hirakud would be one of the key sub projects under the AFP. In order to address this involuntary resettlement, a Resettlement Action Plan (RAP) has been prepared. The RAP has been quite unique as none of the 3,022 persons have land title and hence considered 'squatters' . The RAP has been approved by the World Bank. Key indicators to monitor RAP implementation include: PAPs choosing cash vs housing, development of infrastructure at resettlement sites, timely provision of payment in installments to PAPs relocating to new resettlement sites prior to civil works, provision of assistance measure of INR 25,000/- to female headed households, provision of trainings for income enhancement, etc. RAP also encompasses plans for : labor influx management, GBV and community health and safety measures. In addition, it also provides for a SEMP to be prepared by the contractor (CESMP) before commencing the construction. Institutional and implementation arrangements for executing RAP have been worked out separately. To take care of the issue of diversion of 9.41ha of degraded forest land (and felling of 115 trees within this tract of forest), compensatory afforestation will be done covering the remaining part of the 490ha of forest to improve its health and quality. To compensate for the loss of 3,595 trees elsewhere in non-forest areas, the project will plant a large number of trees(double approx.). All other environmental issues (mainly during construction period) will be taken care by full implementation of the EMP.

Implementation experience of the ESMF provisions and related processes under the original project thus far are as follows: i) Project Screening Templates (PST) including E&S aspects have been diligently filled along with categorization of respective components; ii) such screening and categorizing enabled to identify the major E&S impacts at Hirakud Dam and led to preparation of mitigation plans – EMP and RAP; iii) as provided in ESMF, Project Management Consultants supporting CPMU (CWC) conducted some training programs on the ESMF for the benefit of nodal officers within the SPMU to enhance their capacity, though more training is needed; iv) while the PMC supporting the CPMU (CWC) has E&S specialists, their monitoring and reporting has not been periodic; v) State level IAs do not have any specific person designated or appointed to manage E&S aspects.

Hence in light of the above, the implementation arrangements for the Additional Financing have been further strengthened by: i) appointing or designating one or more officers' familiar with E&S issues as part of the M&E cell within the SPMU, who will review the screening forms, RAPs and EMPs, and other related documents, and monitor compliance with the agreed actions. Comprehensive training on ESMF implementation, monitoring and reporting requirements, would be provided; ii) ensuring detailed progress review by PMC's E&S specialists through increased site visit based reporting; iii) adding relevant clauses on migrant labor and ESHS requirements within contract bid documents and by providing detailed reporting formats; iv) the Bank team will assist IAs having major works, by conducting another round of intensive training on the ESMF provisions, followed by periodic refresher trainings. It will also undertake site visits to review activities such as implementation of RAP at Hirakud and other mitigation measures at other locations.

The ESMF has been updated for use in Additional Financing works, based on implementation experience of the original project and also incorporating: (a) the latest legal and policy developments relating to land and R&R and provisions relating to labor influx and gender based violence in accordance with bank requirements; (b) additional guidance for impacts on forests; and (c) workers' safety and work zone safety, and consequent guidelines for incorporation of appropriate provisions in contract documents.

5. Identify the key stakeholders and describe the mechanisms for consultation and disclosure on safeguard policies, with an emphasis on potentially affected people.

The original ESMF was prepared and disclosed in each state. The ESMF has now been updated, revised and approved



by CWC, has been disclosed in IA's websites and World Bank. In addition, the specific mitigation plans – EMP and RAP that have been prepared for Hirakud Dam, Orissa has been uploaded onto the websites of CWC, DoWR and World Bank, besides their disclosure locally within the project area. Mechanisms for continued consultations have been detailed in the RAP wherein PAPs and affected communities will be consulted through RAP implementation period on all aspects such as provision of entitlements, physical relocation, livelihood restoration, etc.

Further, during project implementation, the farmers in the command areas of the dams will be informed of alterations, if any, in the irrigation delivery schedule on account of the rehabilitation works. Populations living downstream of dams will be made adequately aware of the Emergency Response Plans prepared for specific dams, including their own responsibilities in this regard vis a vis those of the dam management and local authorities. Under the original project, Emergency Action Plans were prepared for 26 dams in accordance with guidelines issued by CPMU – CWC, besides in case of Krishnagiri Dam, community level consultations were held on the draft EAP. Several brochures, pamphlets, posters and videos depicting activities under DRIP as well as dam safety aspects are being prepared by CPMU for wider circulation to all stakeholders and general public for awareness. Several workshops have been conducted in Odisha, Uttarakhand and Kerala for local communities and students. Such activities would continue and also will be scaled up under the Additional Financing.

B. Disclosure Requirements (N.B. The sections below appear only if corresponding safeguard policy is triggered)

Environmental Assessment/Audit/Management Plan/Other

| | | |
|-----------------------------|-----------------------------------|--|
| Date of receipt by the Bank | Date of submission for disclosure | For category A projects, date of distributing the Executive Summary of the EA to the Executive Directors |
| 28-Feb-2018 | 28-Feb-2018 | 18-Jul-2018 |

"In country" Disclosure

India
28-Feb-2018

Comments

Revised document have been subsequently disclosed.

Resettlement Action Plan/Framework/Policy Process

| | |
|-----------------------------|-----------------------------------|
| Date of receipt by the Bank | Date of submission for disclosure |
| 28-Feb-2018 | 28-Feb-2018 |

"In country" Disclosure

India
28-Feb-2018

Comments



Revised document have been subsequently disclosed.

Indigenous Peoples Development Plan/Framework

Date of receipt by the Bank

28-Feb-2018

Date of submission for disclosure

28-Feb-2018

"In country" Disclosure

India

28-Feb-2018

Comments

Revised document have been subsequently disclosed.

Pest Management Plan

Was the document disclosed prior to appraisal?

Yes

Date of receipt by the Bank

28-Feb-2018

Date of submission for disclosure

28-Feb-2018

"In country" Disclosure

India

28-Feb-2018

Comments

Revised document have been subsequently disclosed.

If the project triggers the Pest Management and/or Physical Cultural Resources policies, the respective issues are to be addressed and disclosed as part of the Environmental Assessment/Audit/or EMP.

If in-country disclosure of any of the above documents is not expected, please explain why:

C. Compliance Monitoring Indicators at the Corporate Level (to be filled in when the ISDS is finalized by the project decision meeting) (N.B. The sections below appear only if corresponding safeguard policy is triggered)

OP/BP/GP 4.01 - Environment Assessment

Does the project require a stand-alone EA (including EMP) report?

Yes



If yes, then did the Regional Environment Unit or Practice Manager (PM) review and approve the EA report?

Yes

Are the cost and the accountabilities for the EMP incorporated in the credit/loan?

Yes

OP/BP 4.04 - Natural Habitats

Would the project result in any significant conversion or degradation of critical natural habitats?

No

If the project would result in significant conversion or degradation of other (non-critical) natural habitats, does the project include mitigation measures acceptable to the Bank?

Yes

OP 4.09 - Pest Management

Does the EA adequately address the pest management issues?

Yes

Is a separate PMP required?

No

If yes, has the PMP been reviewed and approved by a safeguards specialist or PM? Are PMP requirements included in project design? If yes, does the project team include a Pest Management Specialist?

NA

OP/BP 4.11 - Physical Cultural Resources

Does the EA include adequate measures related to cultural property?

Yes

Does the credit/loan incorporate mechanisms to mitigate the potential adverse impacts on cultural property?

OP/BP 4.10 - Indigenous Peoples

Has a separate Indigenous Peoples Plan/Planning Framework (as appropriate) been prepared in consultation with affected Indigenous Peoples?

Yes

If yes, then did the Regional unit responsible for safeguards or Practice Manager review the plan?

Yes

If the whole project is designed to benefit IP, has the design been reviewed and approved by the Regional Social Development Unit or Practice Manager?

NA

OP/BP 4.12 - Involuntary Resettlement

Has a resettlement plan/abbreviated plan/policy framework/process framework (as appropriate) been prepared?



Yes

If yes, then did the Regional unit responsible for safeguards or Practice Manager review the plan?

Yes

Is physical displacement/relocation expected?

Yes

Provide estimated number of people to be affected 3,022

Is economic displacement expected? (loss of assets or access to assets that leads to loss of income sources or other means of livelihoods)

No

OP/BP 4.36 - Forests

Has the sector-wide analysis of policy and institutional issues and constraints been carried out?

No

Does the project design include satisfactory measures to overcome these constraints?

No

Does the project finance commercial harvesting, and if so, does it include provisions for certification system?

No

OP/BP 4.37 - Safety of Dams

Have dam safety plans been prepared?

Yes

Have the TORs as well as composition for the independent Panel of Experts (POE) been reviewed and approved by the Bank?

Yes

Has an Emergency Preparedness Plan (EPP) been prepared and arrangements been made for public awareness and training?

Yes

OP 7.50 - Projects on International Waterways

Have the other riparians been notified of the project?

No

If the project falls under one of the exceptions to the notification requirement, has this been cleared with the Legal Department, and the memo to the RVP prepared and sent?

Yes

Has the RVP approved such an exception?

Yes

The World Bank Policy on Disclosure of Information



Have relevant safeguard policies documents been sent to the World Bank for disclosure?

Yes

Have relevant documents been disclosed in-country in a public place in a form and language that are understandable and accessible to project-affected groups and local NGOs?

Yes

All Safeguard Policies

Have satisfactory calendar, budget and clear institutional responsibilities been prepared for the implementation of measures related to safeguard policies?

Yes

Have costs related to safeguard policy measures been included in the project cost?

Yes

Does the Monitoring and Evaluation system of the project include the monitoring of safeguard impacts and measures related to safeguard policies?

Yes

Have satisfactory implementation arrangements been agreed with the borrower and the same been adequately reflected in the project legal documents?

Yes

CONTACT POINT

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Madhya Pradesh Water Resources Department

Central Water Commission under Ministry of Water Resources, River Development and Ganga Rejuvenation



Damodar Valley Corporation (DVC)

Karnataka Water Resources Development Organisation

Kerala State Electricity Board

Kerala Water Resources Department

Odisha Water Resource Department

Tamil Nadu Water Resources Department

TANGEDCO Tamil Nadu

Uttarakhand Jal Vidyut Nigam Limited

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APPROVAL

| | |
|----------------------|----------------------------|
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|----------------------|----------------------------|

Approved By

| | | |
|---------------------------|---------------------|-------------|
| Safeguards Advisor: | Maged Mahmoud Hamed | 07-Aug-2018 |
| Practice Manager/Manager: | Michael Haney | 07-Aug-2018 |
| Country Director: | Junaid Kamal Ahmad | 08-Aug-2018 |

